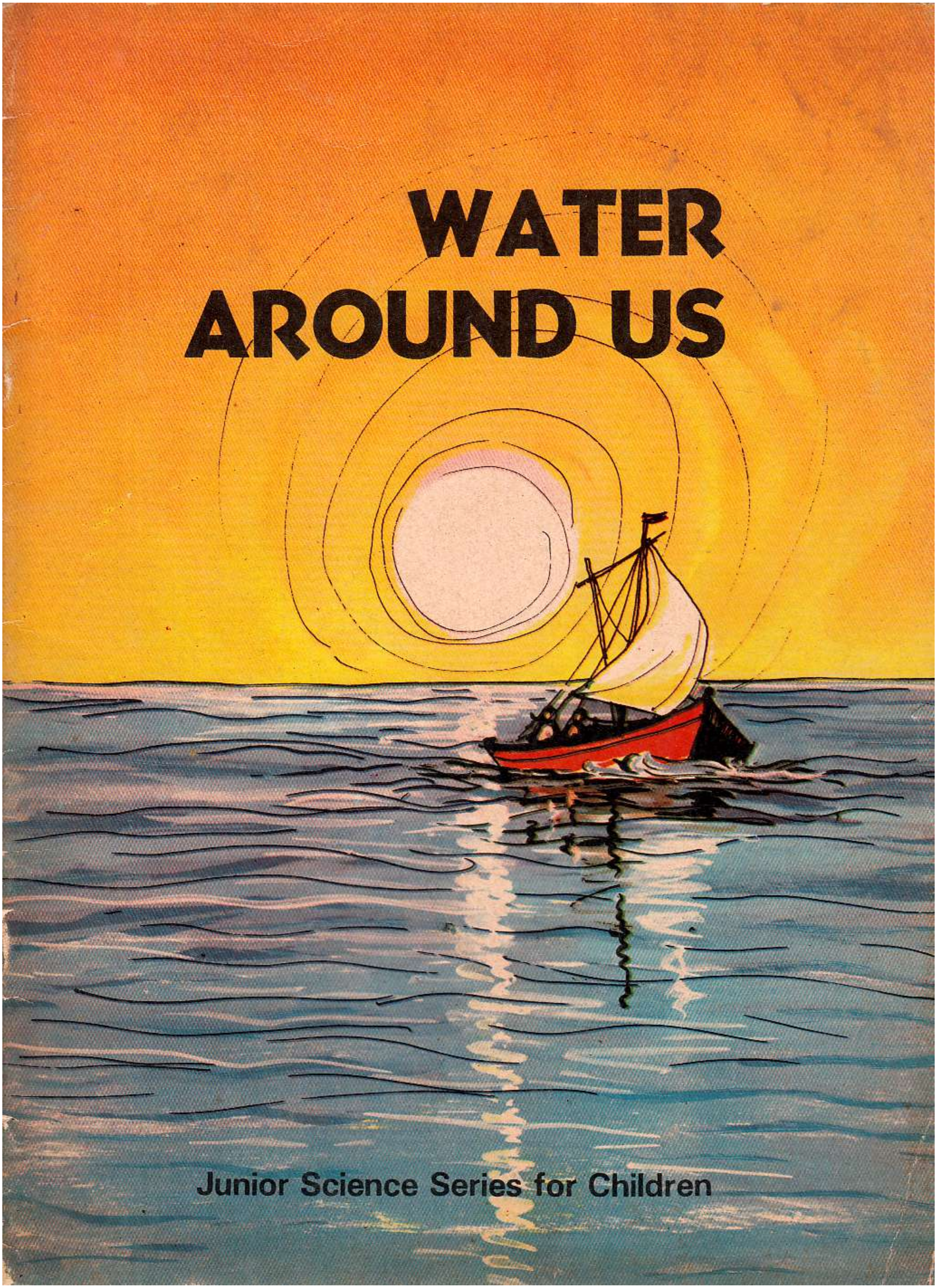
WATER AROUND US

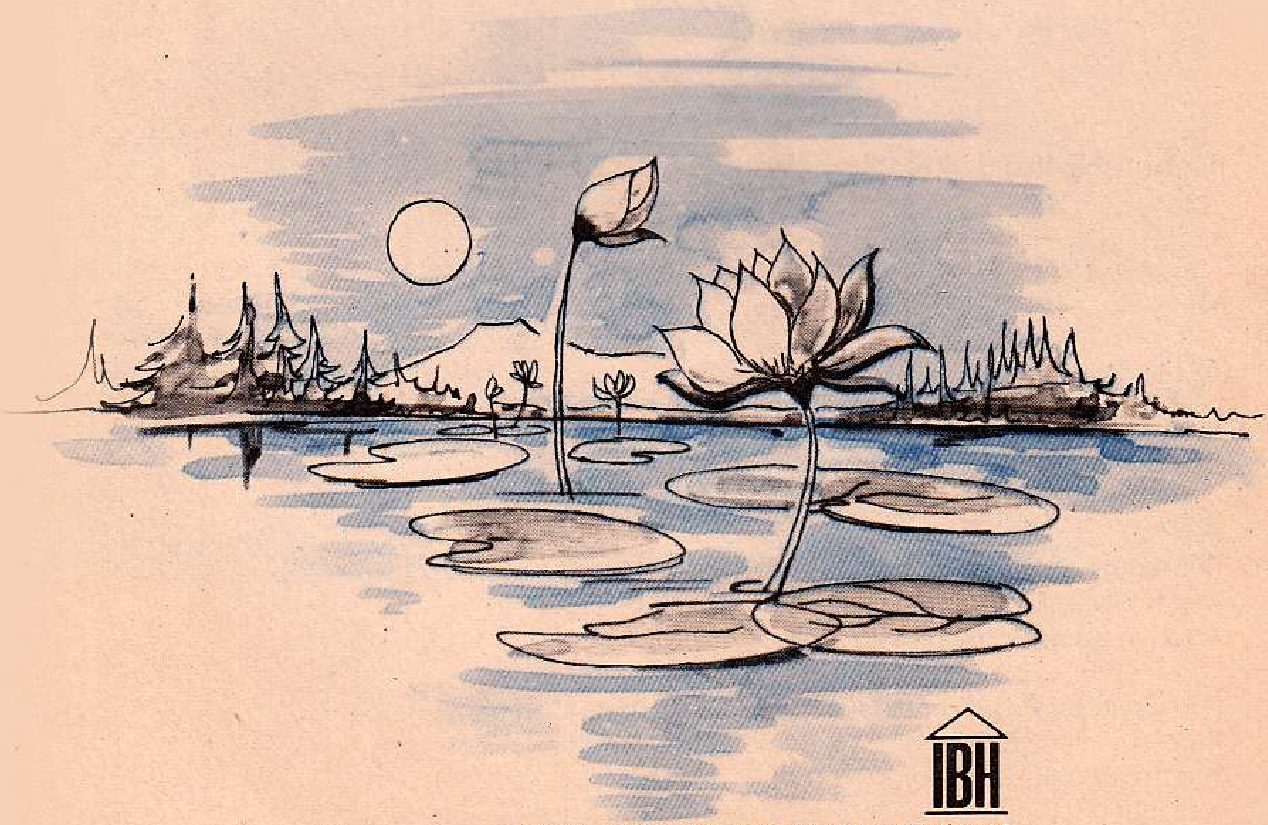


Junior Science Series for Children

WATER AROUND US

By
M. Mohan

Illustrations by
Pratima



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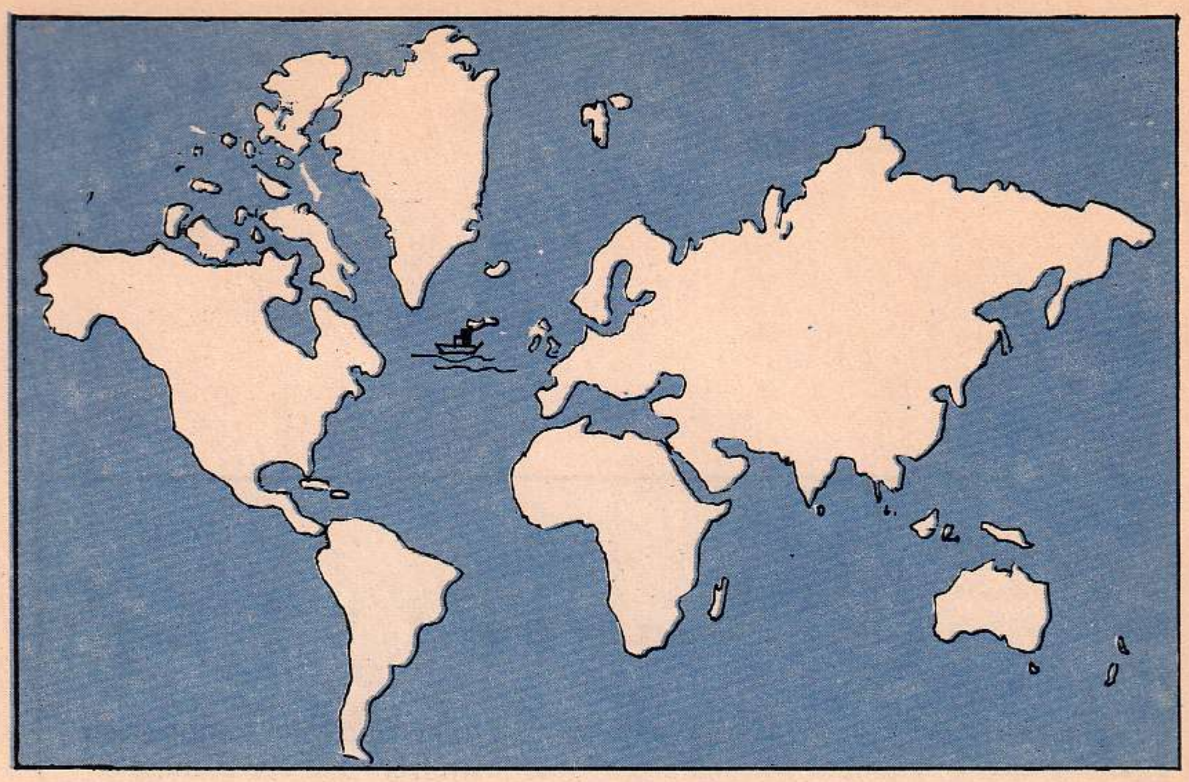
About the Book

As children grow in the natural environment, they take such things as air and water for granted. Yet, there is a lot to learn from and about these things. An attempt has been made in this book to introduce children to the sources of water, the water cycle and a few games that they would enjoy playing with water.

Another book with the title : Water, the Unusual Liquid, has been prepared at secondary level which explains its unusual properties in comparison to liquids of similar components as water.

Children should be encouraged to play the games mentioned in the last few pages of the book. If a child asks some questions on the basis of his observations which the parents are unable to answer, the child may be advised to consult his science teacher in the school.

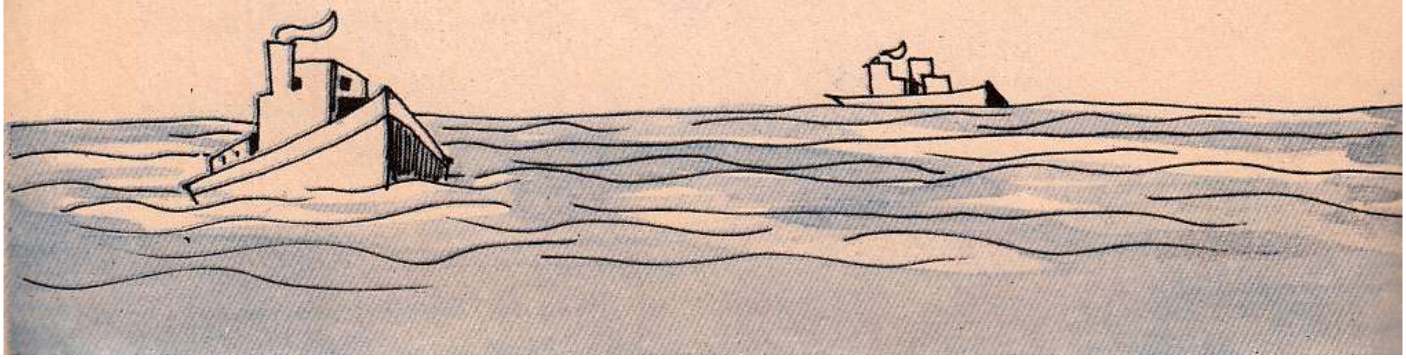


We live on the earth.

The earth has land and water. It is surrounded by air.
Look at the map of the earth. The land area is in white.
The water area is in blue.

There are several big oceans on the earth.
An ocean is thousands of kilometres long.
It is thousands of kilometres broad.
An ocean is so large that you cannot see its other end from one end.

A sea-ship takes about a week to reach New York from London across the Atlantic Ocean, if it travels day and night without stopping in-between.

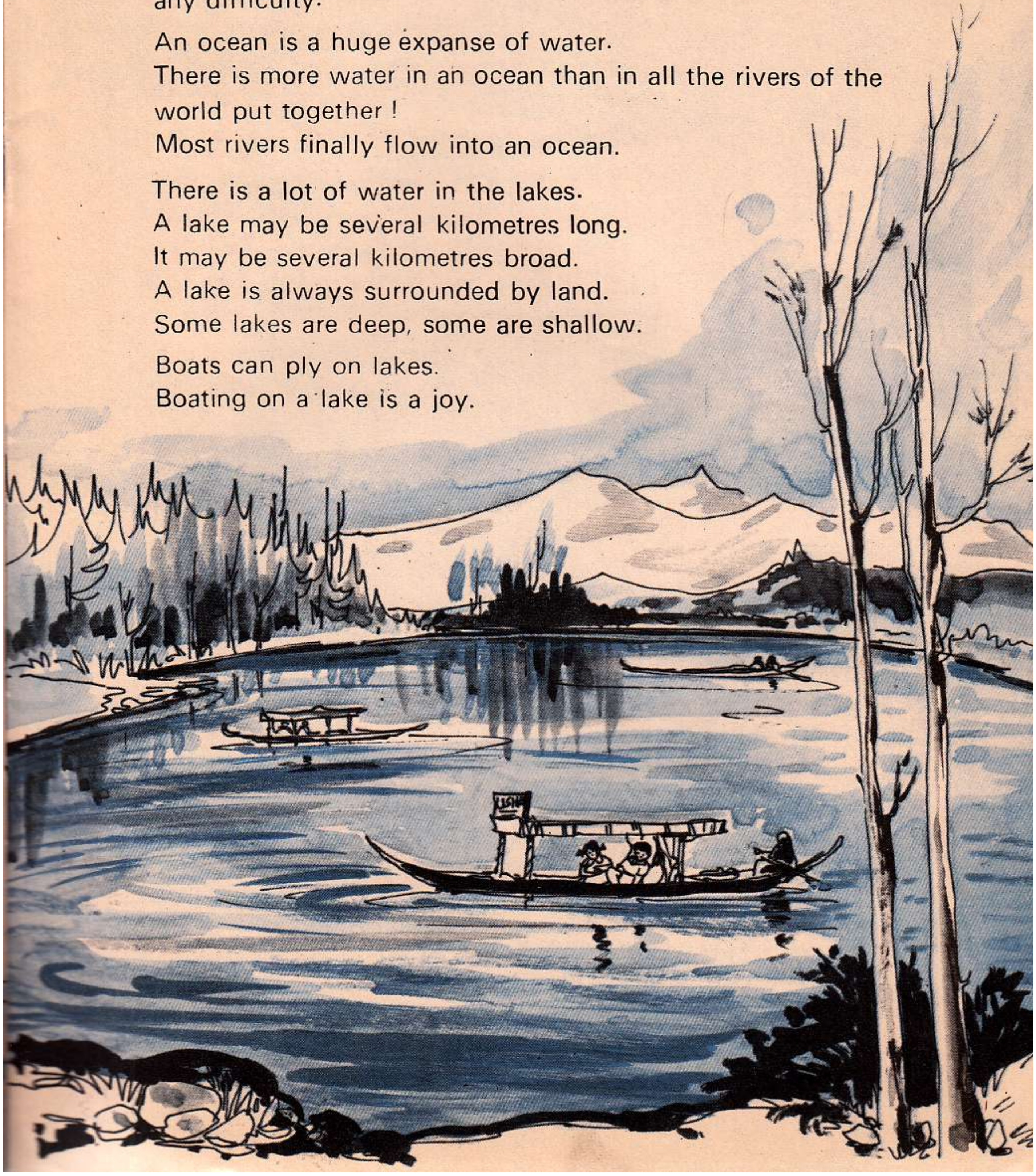


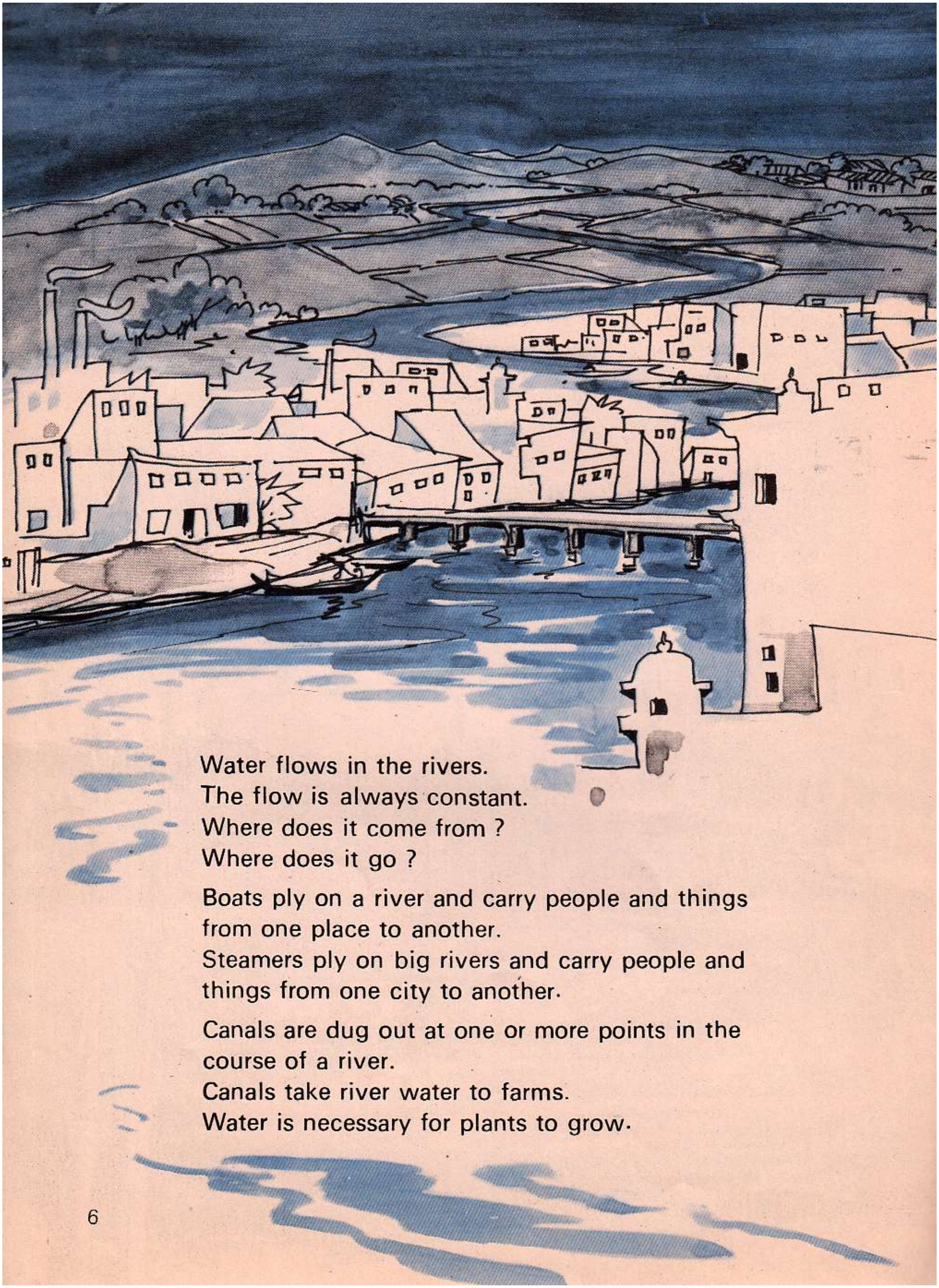
An ocean is several kilometres deep. If a part of the Himalaya with Mount Everest were dropped in an ocean, it will easily sink in it and ships can still sail over the ocean-surface without any difficulty.

An ocean is a huge expanse of water.
There is more water in an ocean than in all the rivers of the world put together !
Most rivers finally flow into an ocean.

There is a lot of water in the lakes.
A lake may be several kilometres long.
It may be several kilometres broad.
A lake is always surrounded by land.
Some lakes are deep, some are shallow.

Boats can ply on lakes.
Boating on a lake is a joy.





Water flows in the rivers.
The flow is always constant.
Where does it come from ?
Where does it go ?

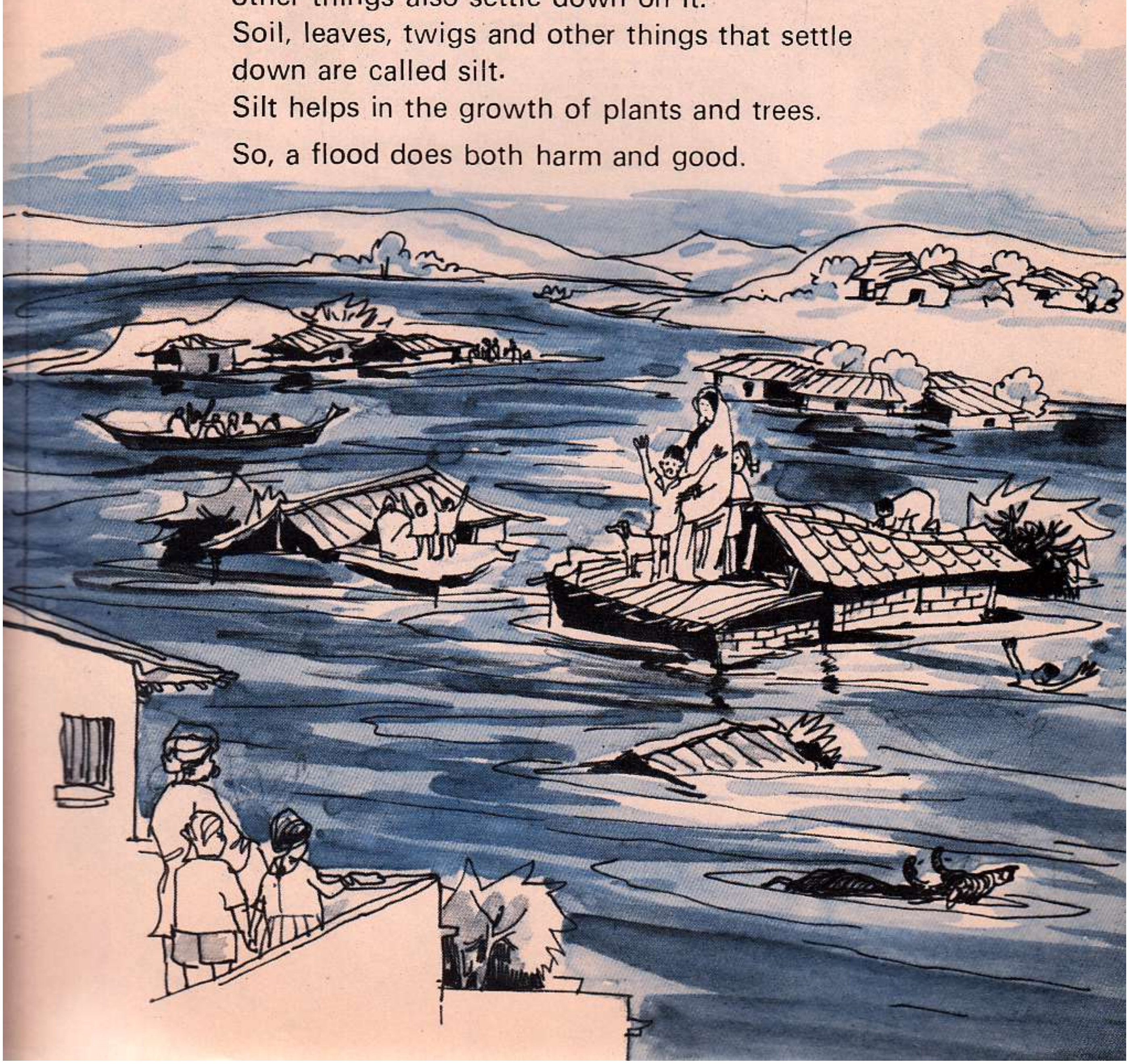
Boats ply on a river and carry people and things from one place to another.
Steamers ply on big rivers and carry people and things from one city to another.

Canals are dug out at one or more points in the course of a river.
Canals take river water to farms.
Water is necessary for plants to grow.

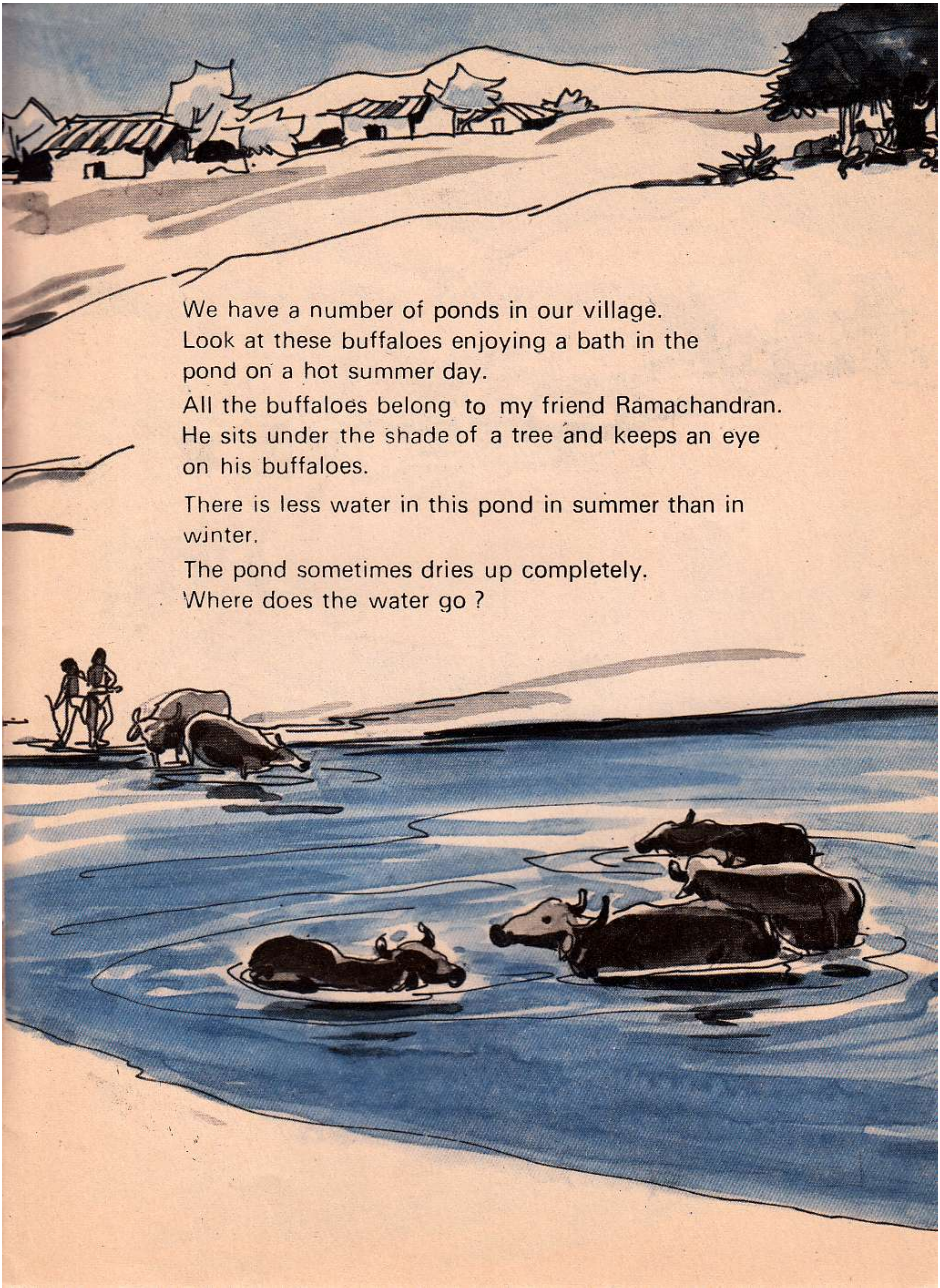
A river is sometimes in flood when there is heavy rainfall for a number of days. Water rises higher and higher.
It overflows the banks and spreads over a large area.
It damages crops, houses and other property.

Flood water is always muddy.
There are some leaves and twigs floating in it.
When flood water stands on land for some time, the mud settles down on it. Leaves, twigs and other things also settle down on it.
Soil, leaves, twigs and other things that settle down are called silt.
Silt helps in the growth of plants and trees.

So, a flood does both harm and good.



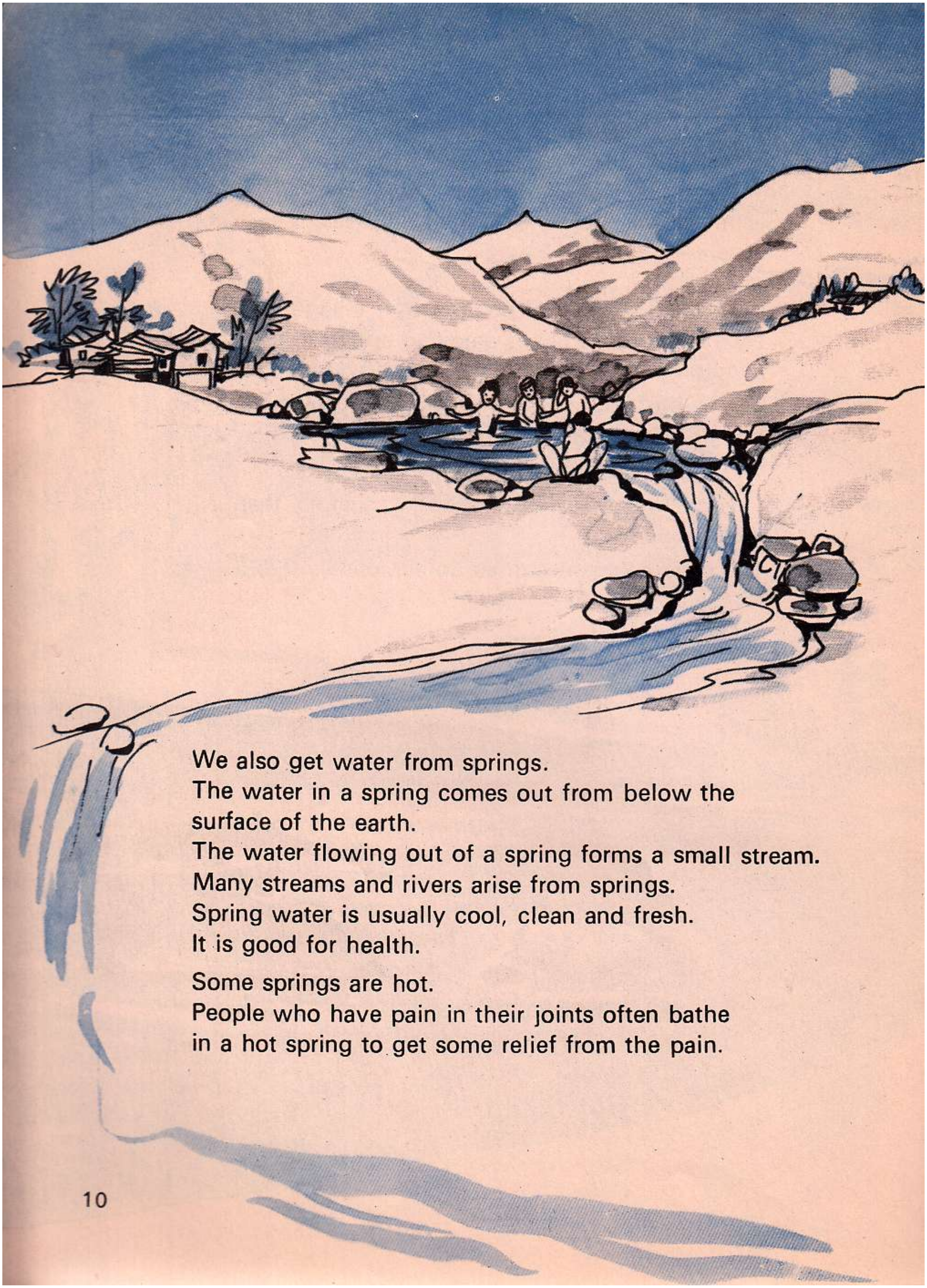
Mustafa lives near the village well.
This well is very deep.
It has a lot of water in it.
The villagers draw water from it.
They use it for drinking, washing clothes, taking a bath
cooking food and cleaning their houses.



We have a number of ponds in our village.
Look at these buffaloes enjoying a bath in the pond on a hot summer day.
All the buffaloes belong to my friend Ramachandran.
He sits under the shade of a tree and keeps an eye on his buffaloes.

There is less water in this pond in summer than in winter.

The pond sometimes dries up completely.
Where does the water go ?



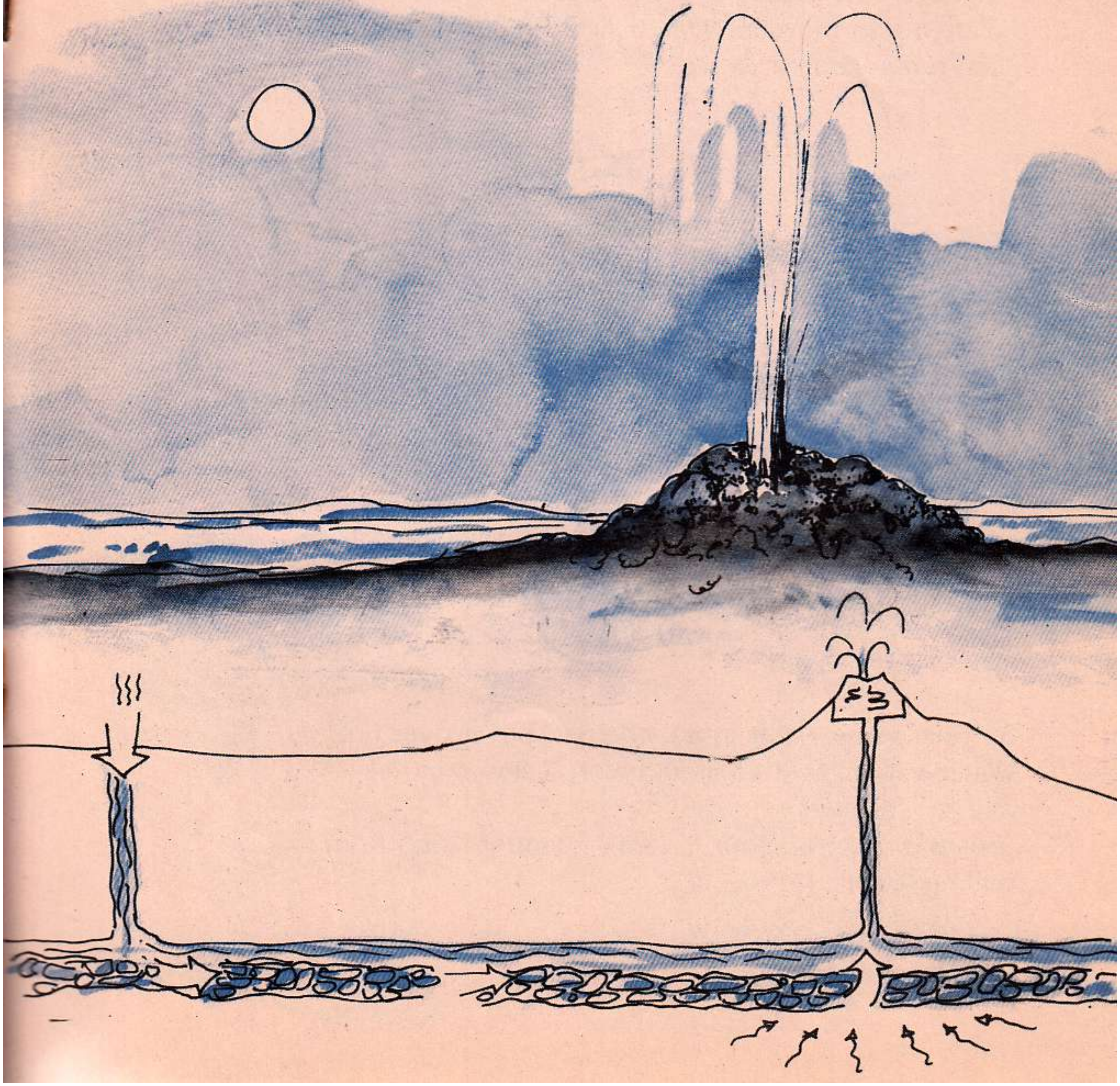
We also get water from springs.
The water in a spring comes out from below the surface of the earth.
The water flowing out of a spring forms a small stream.
Many streams and rivers arise from springs.
Spring water is usually cool, clean and fresh.
It is good for health.

Some springs are hot.
People who have pain in their joints often bathe in a hot spring to get some relief from the pain.

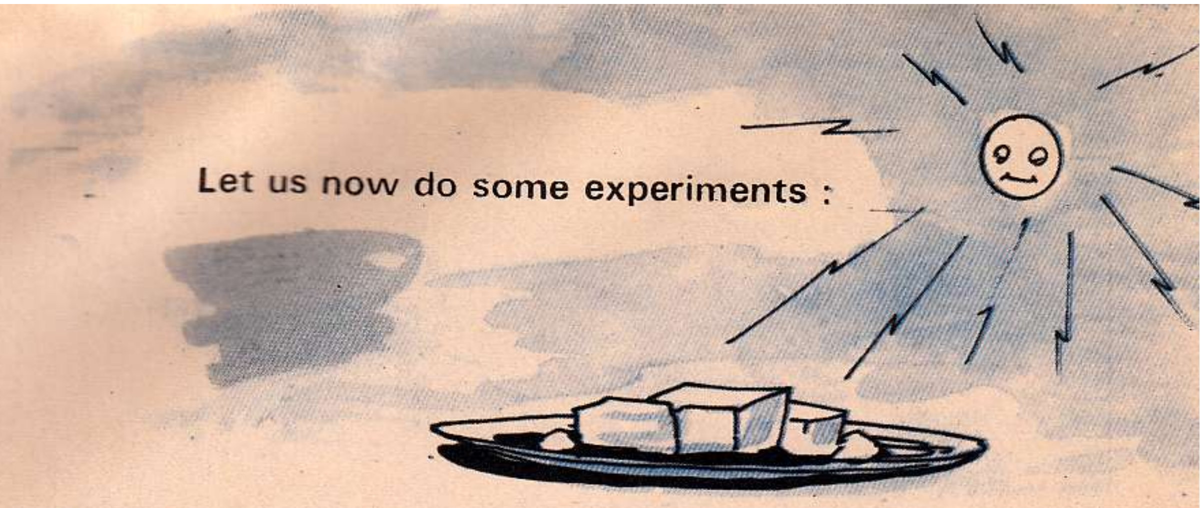
There are geysers at several places in the world.
A geyser is a spring from which steam and hot water gush out.

Steam and hot water come out from below the surface of the earth.

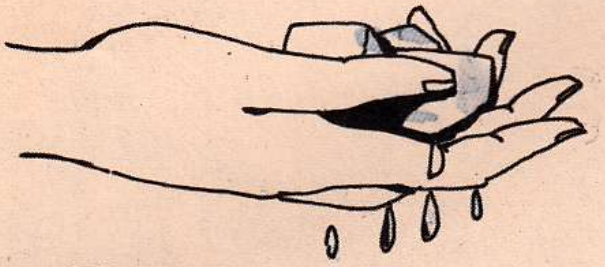
What makes the water inside the earth hot and turn into steam?
There is much heat inside the earth!



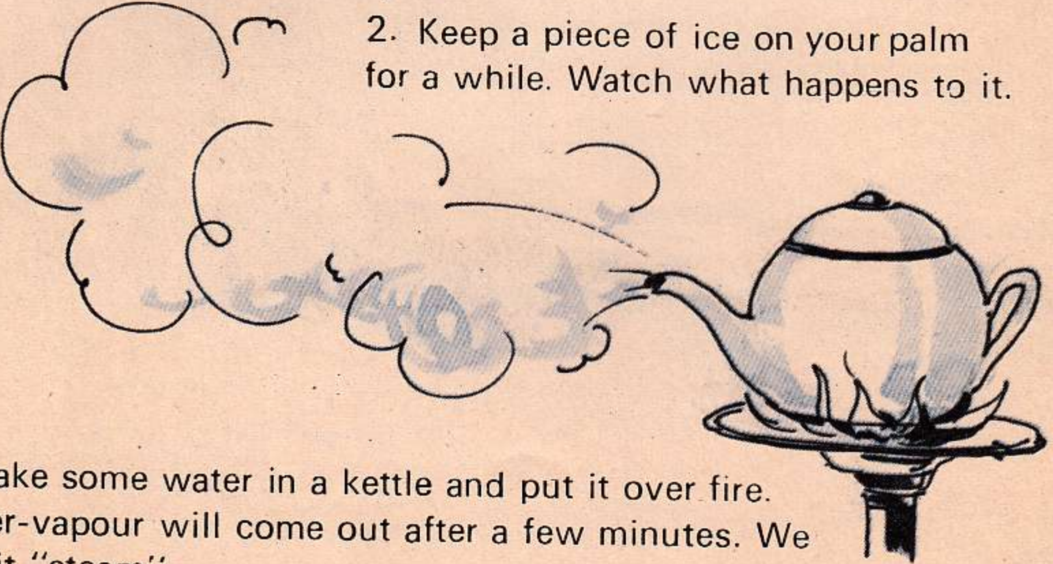
Let us now do some experiments :



1. Put a few pieces of ice in a plate. Keep the plate out in the sun. Watch what happens. The heat of the sun turns ice into water.



2. Keep a piece of ice on your palm for a while. Watch what happens to it.



3. Take some water in a kettle and put it over fire. Water-vapour will come out after a few minutes. We call it "steam".

Steam is water-vapour in large quantity rising from boiling water.

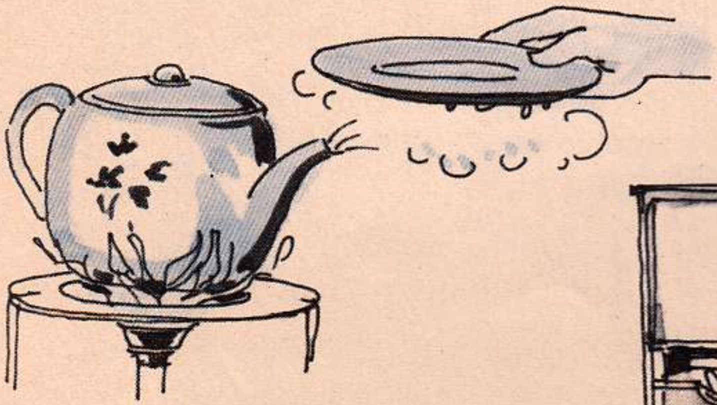
4. Next, hold a clean plate over the steam coming out of the kettle. Take it away after a while. Do you see some drops formed on the plate ? These are drops of water. The plate was less hot than the steam. So, it took away some heat out of the steam. In this way steam changed into water on cooling.

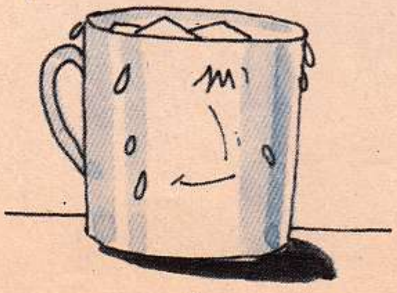
5. Put some water into the ice tray of a refrigerator and put it back in its place. Take it out after an hour or so. Water has turned into ice. The heat in the water has escaped into the cold air inside the refrigerator. So, the water has turned into ice.

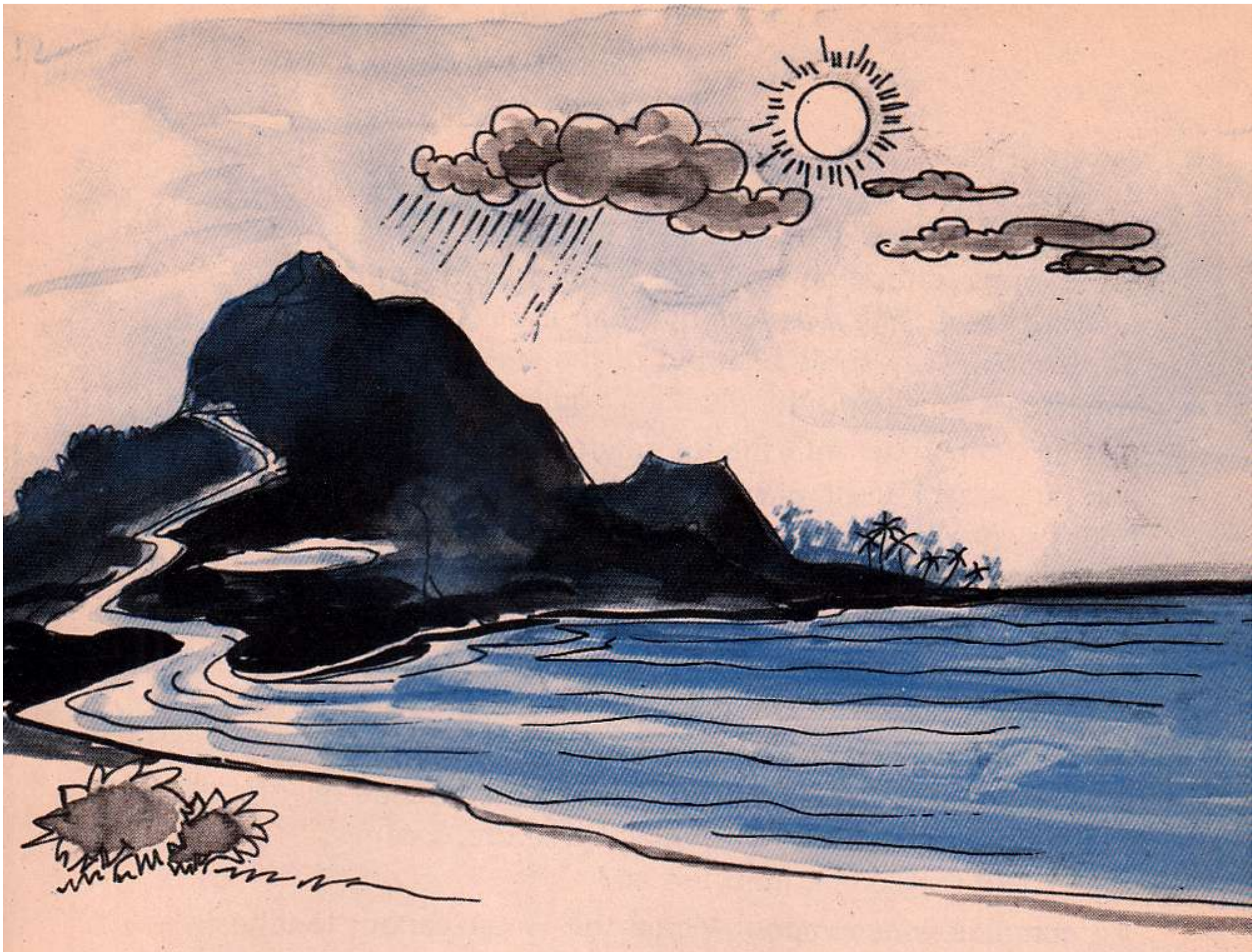
6. Keep some ice cubes in a steel tumbler. Wipe the tumbler dry on the outside. Cover it with a plate. See what happens.

Do you see some small water drops on the outside of the tumbler ? Where do you think these drops came from ? Did they come from the air?

Air contains water-vapour. When the water-vapour touches the cold surface of the tumbler, the vapour gets cooled and changes into water.

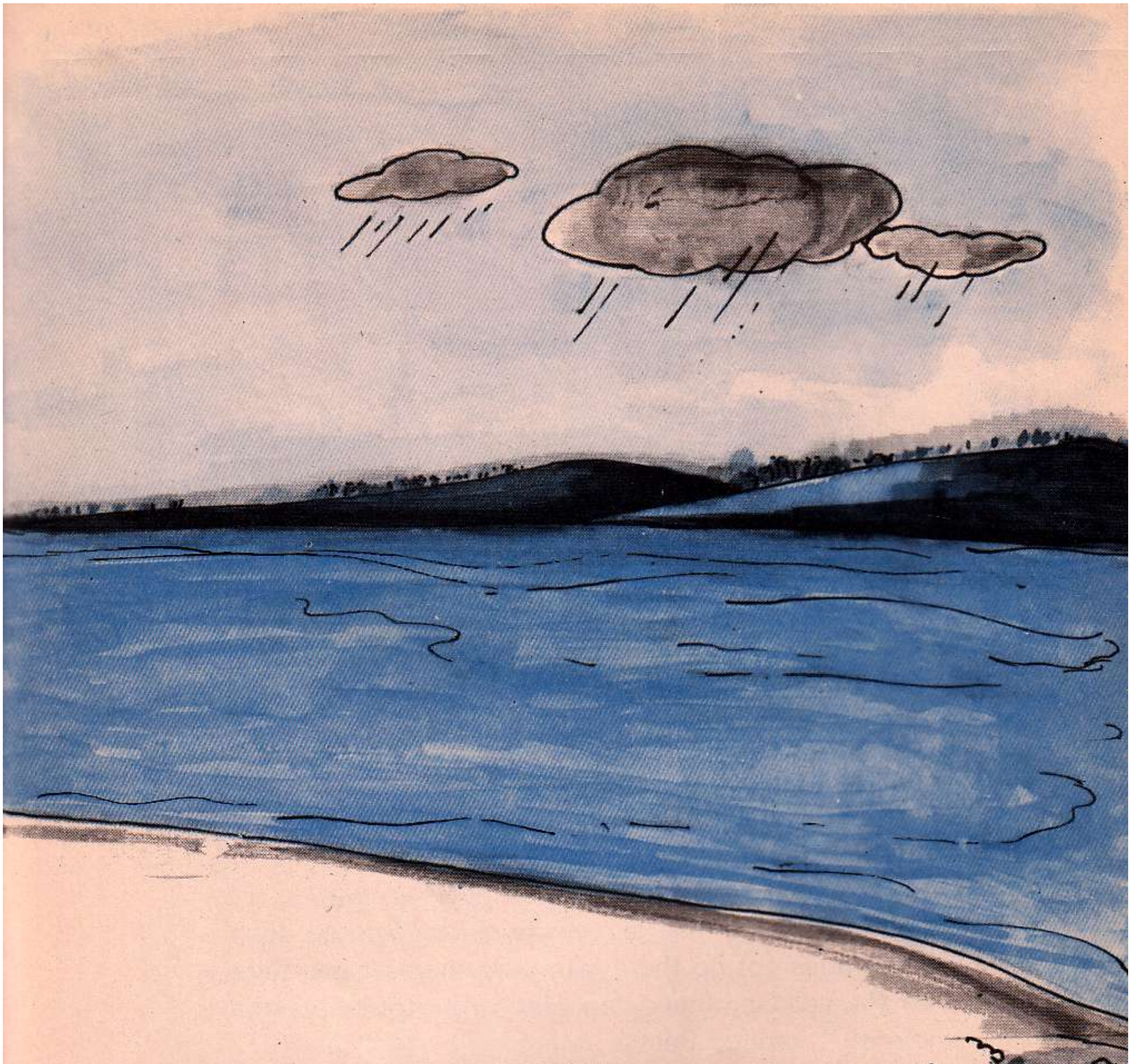






There is water in the oceans, rivers, streams, canals, springs and ponds around us. The heat of the sun turns the top layer of this water into water-vapour. This vapour mixes with the surrounding air. So, some water-vapour is always present in the air. We call it humidity.

We see many clouds in the rainy season.
Clouds are tiny water-droplets floating close together.
When clouds pass through an area of very cool air, these water-droplets grow into bigger water-drops.
When the water-drops fall down, we call it rain.



Watch a rainfall carefully. Where does rain water go? A part of it goes down inside the earth. A part of it remains on land for some time. But it later disappears. Where does it go?

It turns slowly into water-vapour and disappears into the surrounding air.

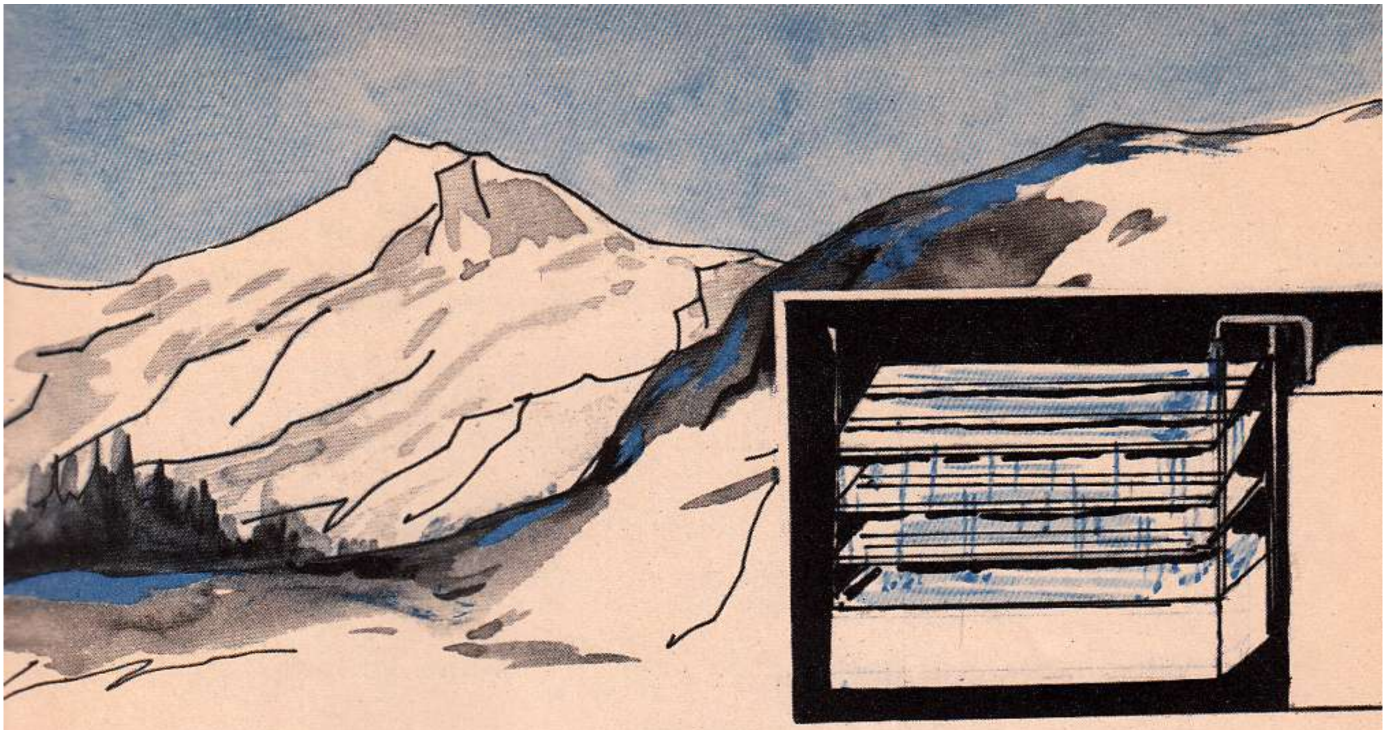
"Look at the beautiful mountain-top there," said John. "Yes, it shines like silver. It is snow that shines," replied Salma.

"But how does snow reach over there, at that height, which no man can easily climb?" asked John.

"Snow does not go there from anywhere. It just falls over the cold mountain-top. Have you not heard of a snowfall?" replied Salma.

"We do not have a snow-fall at Chandigarh. Why does it fall over those mountain-tops?" asked John.

"Look, it is very simple. The air over high mountains is very cold. When clouds pass through such cold areas, the tiny water-droplets change into snow. In a cold area, the droplets grow into bigger drops, and we have rain. But in a very cold area, the droplets are changed into snow, and there is a snow-fall," said Salma.



"Now I understand it, Salma. Cold air over high mountains takes away some heat from the water-vapour which form clouds and turns it into tiny water-droplets. Many tiny water-droplets grow to form a water drop. When the water-drops pass through very cold air, more heat escapes from them and they are turned into snow," said John.

"The snow remains on the mountain-tops for a few months and becomes hard. We call it ice. The ice gradually melts and turns into water. Water flows down a mountain in a stream. Several streams join together and form a river," said Salma.

"Is that how the river Chenab has been formed ? " asked John. "Yes, that is how most rivers are formed," replied Salma.

Ice is prepared in ice factories in cities.
Water is cooled in machines in the factory. Heat goes out of the water and it turns into ice. Ice is water with very little heat in it.

What did we learn ?

There is water in the oceans, lakes, rivers, ponds and springs.

There is water in the air in the form of water-vapour. We call it humidity.

Clouds are tiny water-droplets. When clouds pass through cold air, it rains. When they pass through very cold air, it snows.

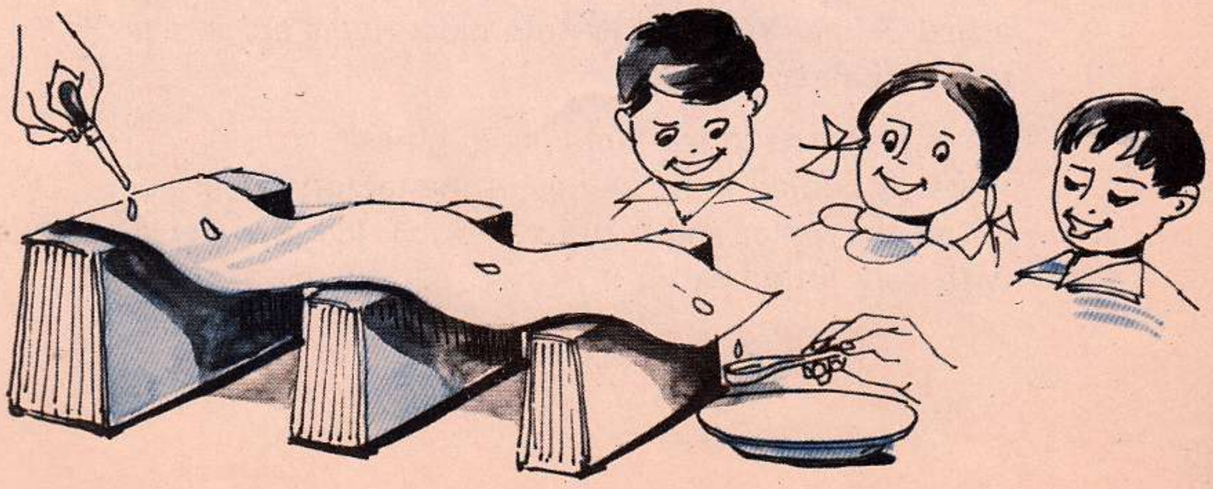
Heat turns ice into water. More heat turns water into vapour. When heat is taken out of water-vapour, it changes into water.

When more heat goes out of water, it changes into ice.

Now we can play a few games :

1. Arrange in a line three books of different sizes and a plate. Take a strip of oiled paper, about 5 centimetres wide, and spread it over the books, as shown. Use a dropper and let a drop of water fall gently on the highest part of the oiled paper. Watch what happens. The water-drop rolls down the first slope, goes up the second slope, again down the third, and so on. You can catch the drop in a spoon when it is about to fall into the plate.

Three friends can take turns, each having four chances. One who can catch the largest number of drops, is the winner.

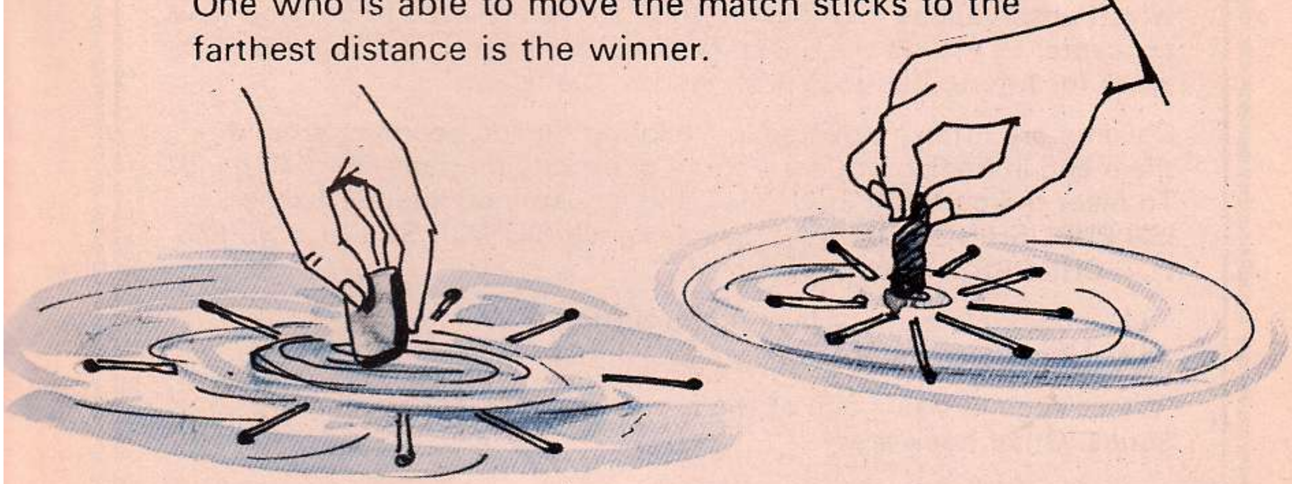


2. Fill a wash basin three-fourths with water. Arrange eight match sticks in a circle on the water, as shown. Touch the water in the centre with a soap piece and watch what happens. The match sticks move towards the edge of the basin.

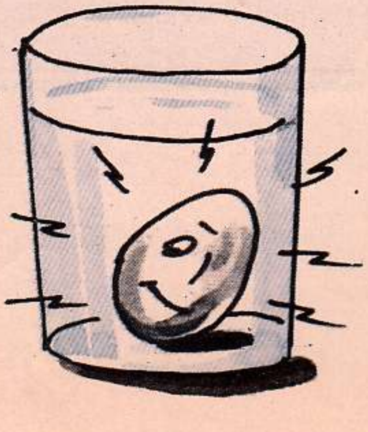
It appears as if soap has repelled the match sticks

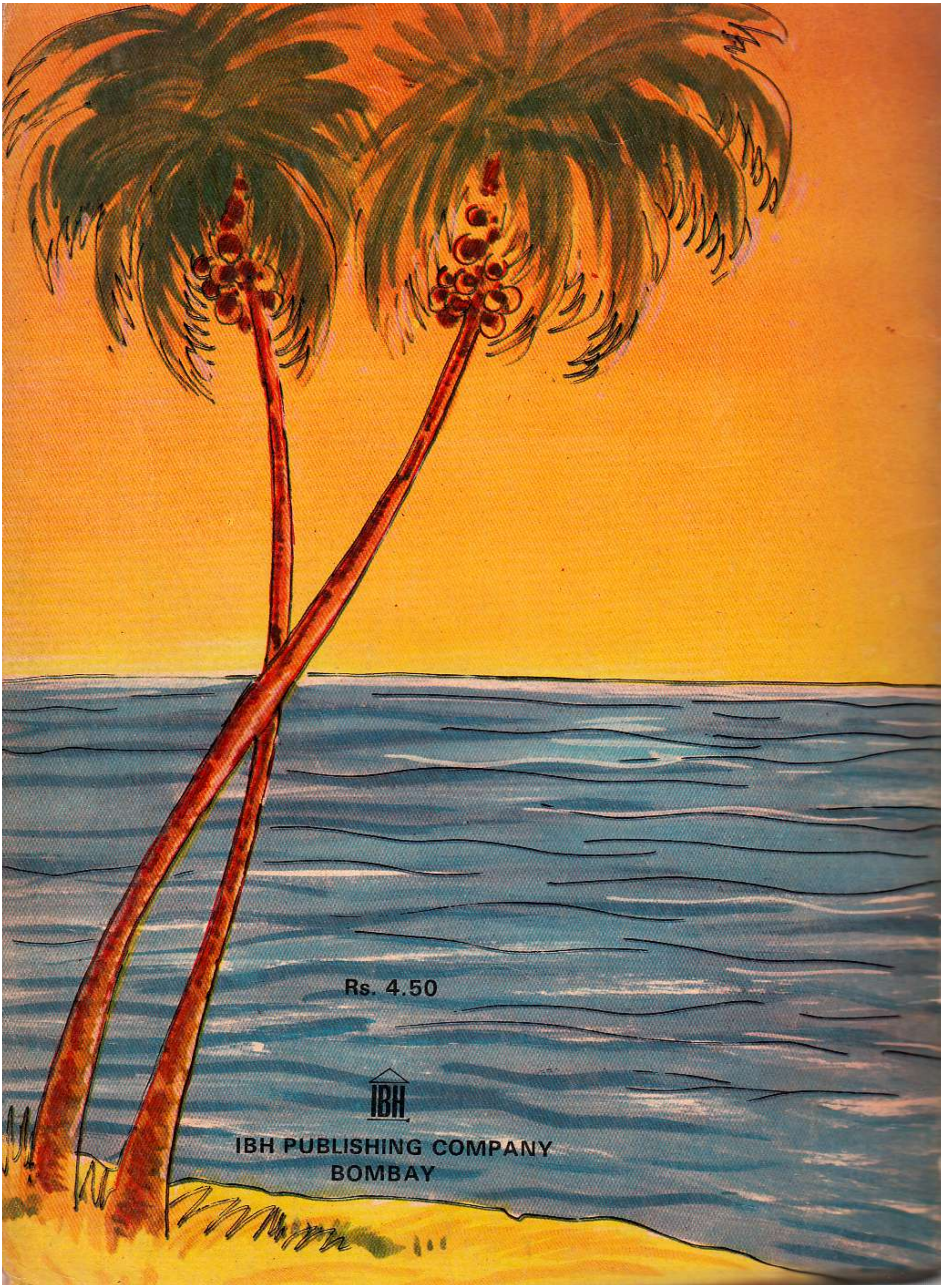
Next, touch the water in the centre with a lump of sugar. Watch what happens. The match sticks move towards the centre. It appears as if sugar has attracted the match sticks

Three friends can try the experiment, one after another. One who is able to move the match sticks to the farthest distance is the winner.



3. Take an egg. Hold it over a smoky oil lamp and blacken its shell completely. Lower it gently into a glass tumbler full of water. The egg appears to shine. Again, three friends can play this game, each blackening an egg and lowering it gently in a separate glass tumbler of water. One who gets the best shine is the winner.





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